

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A method for use in recording/reading data from an array of data units within a three-dimensional storage medium, the method comprising:

- (a) providing exciting radiation in the form of first and second light beams of first and second different wavelengths, respectively;
- (b) concurrently directing said first and second light beams and focusing them onto two sites in the medium at a predetermined distance between them, and collecting excited light of a third wavelength coming from the excited site in the medium to form a third excited light beam and direct it towards a detector assembly, while correcting for chromatic and spherical aberrations of the light focusing and collection, said focusing comprising passing the exciting light beams through a focusing/collecting arrangement comprising two lens

assemblies arranged in a spaced-apart relationship along an optical axis of the focusing/collecting arrangement, one of said two lens assemblies being configured to perform the majority of light bending required for the focusing of the exciting light, and the other of said two lens assemblies being configured to carry out the majority of compensation for changing spherical aberration introduced by a change in a thickness of the medium into which the exciting light is being focused;

- (c) sequentially repeating step (b) for successive sites in the medium with varying depth of focus.

2. (previously presented) The method of Claim 1, wherein said collecting includes passing the excited light through the same focusing/collecting arrangement.

3. (currently amended) The method of Claim 1-~~or~~ 2, wherein the focusing/collecting arrangement is configured and oriented relative to the medium and to light source and detector assemblies for focusing the exciting light beams to sites spaced from each other a predetermined distance and collecting the excited light from the excited site in the medium.

4. (currently amended) The method of ~~any one of Claims~~
Claim 2-or-3, wherein said two lens assemblies are
accommodated in the optical path of the exciting and excited
light beams, said one of said two lens assemblies being
designed to perform the majority of light bending required
for the focusing of the exciting light and for collecting the
excited light.

5. (currently amended) The method of ~~any one of preceeding~~
~~Claims~~Claim 1, wherein said lenses of the focusing/collecting
arrangement have different surface geometries, at least one
of these surfaces being aspheric.

6. (currently amended) The method of ~~any one of preceeding~~
~~Claims~~Claim 1, wherein that one of the two lens assemblies
which is designed to compensate for changing spherical
aberration is located closer to the medium.

7. (currently amended) The method of ~~any one of preceeding~~
~~Claims~~Claim 1, wherein each of said two lens assemblies
comprises a single lens.

8. (currently amended) The method of ~~any of Claims~~ Claim
~~1-to-6~~, wherein that one of the two lens assemblies which is

designed to perform the majority of light bending is configured to define two lens portions of different materials and geometries.

9. (currently amended) The method of Claim 8, wherein said lens portions are separate lens elements arranged in a spaced-apart relationship along the optical axis and are arranged either with a gap between them or being attached to each other.

10. (Cancelled)

11. (currently amended) The method ~~of any one of preceding Claims~~ Claim 1, wherein said lens assembly located closer to the medium includes a flying lens.

12. (currently amended) The method of ~~any one Claim 1-6 or 8~~, wherein that one of the two lens assemblies which is designed to perform the majority of light bending is located closer to the medium, the other one of the two lens assemblies being a multiple-lens assembly.

13. (currently amended) The method of ~~any one of preceding Claims~~ Claim 1, wherein the varying of the depth of

focus comprises displacing at least one of the lenses of the focusing/collecting arrangement with respect to at least one other lens thereof along an optical axis defined by the focusing/collecting arrangement.

14. (previously presented) The method of Claim 13, comprising displacing the focusing/collecting arrangement with respect to the medium.

15. (Currently Amended) The method of ~~any one of~~ ~~preceding Claims~~ Claim 1, wherein the varying of the depth of focus comprises varying the optical path lengths of the exciting light beams and the optical path of the excited light while propagating towards and away from the medium. respectively.

16. (previously presented) The method of Claim 15, comprising displacing light sources, detector and focusing/collecting arrangement with respect to the medium.

17. (Currently Amended) The method of Claim 15 ~~or 16~~, comprising displacing the medium with respect to the focusing/collecting arrangement.

18. (presented previously) The method of ~~any one of~~
~~preceding Claims~~ Claim 1, wherein the ~~correction of chromatic~~
~~aberrations is carried out by~~ comprising pre-shaping the
exciting beams so as to provide arrival of each of the
excited beams to the focusing/collecting arrangement with a
desired degree of the beam divergence/convergence, and post-
shaping of the excited beam so as to provide the excited beam
arrival at a detector assembly with a desired degree of the
excited beam divergence/convergence, ~~while correction of~~
~~spherical aberration is carried out substantially by the~~
~~focusing/collecting arrangement.~~

19. (previously presented) The method of Claim 18,
wherein said pre-shaping comprises ~~providing~~ carrying out
either a small or a large degree of divergence/convergence of
each of the first and second exciting light beams arriving at
the focusing/collecting arrangement, thereby providing,
respectively, either semi-infinite or finite conjugation of
the first and second beams.

20. (Cancelled)

21. (Currently Amended) The method of Claim 19 ~~or 20~~,
comprising passing each of the first and second exciting

light beams through a lens assembly appropriately designed and oriented with respect to a corresponding light source to provide the desired degree of the beam divergence/convergence.

22. (Currently Amended) The method of Claim 19~~or 20~~, comprising accommodating the focusing/collecting arrangement at certain distances from first and second light sources generating said first and second light beams, to provide the desired degree of divergence/convergence of each of the first and second light beams when arriving at the focusing/collecting arrangement.

23. (Currently Amended) The method of Claim ~~16~~18, wherein said pre-shaping comprises carrying out one of the following: collimating one of the first and second exciting light beams and providing a small degree of divergence/convergence of the other of said first and second exciting beams when arriving at the focusing/collecting arrangement so as to provide semi-infinite conjugation of said other beam; or collimating each of said first and second exciting light beams, while propagating towards the focusing/collecting arrangement.

24. (Cancelled)

25. (Currently Amended) The method of ~~any one of~~
~~preceding Claims~~ Claim 1, wherein that one of the two lens
assemblies of the focusing/collecting arrangement that is
located closer to the medium is kept at a constant distance
from the medium, and at least one other lens of the
focusing/collecting arrangement is movable along the optical
axis.

26. (Currently Amended) The method of ~~any one of Claims~~
~~Claim 12 to 25~~, wherein said multiple-lens assembly comprises
three lenses arranged in a spaced-apart relation along the
optical axis.

27. (previously presented) The method of Claim 26,
wherein said varying of the depth of focus comprises moving
an intermediate one of said three lenses along the optical
axis.

28. (Currently Amended) The method of ~~any one of~~
~~preceding Claims~~ Claim 1, wherein said first and second
exciting beams are operated to carry out one of the
following: the first and second beams are respectively
reading and recording light beams; the first and second

exciting beams are reading light beams; and first and second
exciting beams are recording light beams.

29. (Cancelled)

30. (Cancelled)

31. (previously presented) An optical system for use in recording/reading data from an array of data units within a three-dimensional storage medium, the system being configured for correcting for aberrations of light focusing and collection, and comprising:

(a) a light source assembly operable to produce exciting radiation in the form of first and second light beams of first and second different wavelengths, respectively, thereby enabling excitation of sites in the medium to produce excited light of a third wavelength;

(b) a detector assembly for receiving the excited light and generating data indicative thereof;

(c) a focusing/collecting assembly configured to enable directing the exciting light beams and focusing

them onto the sites spaced from each other a predetermined distance and for collecting the excited light to form an excited light beam to propagate towards the detector assembly, said focusing/collecting arrangement comprising two lens assemblies arranged in a spaced-apart relationship along an optical axis of the focusing/collecting arrangement, one of said two lens assemblies being configured to perform the majority of light bending required for the focusing of the exciting light and collecting the excited light, and the other of said two lens assemblies being configured to carry out the majority of compensation for changing spherical aberrations introduced by a change in a thickness of the medium into which the exciting light is being focused; and

(d) a drive means associated at least with the focusing/collecting arrangement to move at least one of lenses of the focusing/collecting arrangement along the optical axis of the focusing/collecting arrangement to thereby effect variation of a depth of focus, while the exciting radiation is applied to successive sites in the medium during a relative displacement between the system and the medium.

32. (previously presented) The system of Claim 31, comprising a beam shaping assembly accommodated in the optical paths of the first and second exciting beams and operating to pre-shape each of these beams to arrive at the focusing/collecting arrangement with desired degree of divergence/convergence, and to post-shape the collected excited light beam while propagating towards the detector.

33. (Currently Amended) The system of Claim 31-~~or 32~~, wherein the lenses of the focusing/collecting arrangement have different surface geometries, at least one of these surfaces being aspheric.

34. (Currently Amended) The system of ~~any one of Claims~~ Claim 31 to 33, wherein that one of the two lens assemblies which is designed to compensate for changing spherical aberration is located closer to the medium.

35. (previously presented) The system of Claim 34, wherein each of said two lens assemblies comprises a single lens.

36. (previously presented) The system of Claim 34, wherein that one of the two lens assemblies which is designed to

perform the majority of light bending is configured to define two lens portions of different materials and geometries.

37. (Currently Amended) The system of Claim 36, wherein said lens portions are separate lens elements arranged in a spaced-apart relationship along the optical axis either with a gap between them or being attached to each other.

38. (Cancelled)

39. (Currently Amended) The system of ~~any one of Claims~~ Claim 34 to 38, wherein said lens located closer to the medium is a flying lens.

40. (previously presented) The system of Claim 31, wherein that one of the two lens assemblies which is designed to perform the majority of light bending is located closer to the medium, the other one of the two lens assemblies being a multiple-lens assembly.

41. (previously presented) The system of Claim 37, wherein said multiple-lens assembly comprises three lenses arranged in a spaced-apart relation along the optical axis

42. (Currently Amended) The system of ~~any one of~~
~~Claims Claim 31 to 41~~, wherein said drive means is configured and
operates operable carry out at least one of the following: to
displace that one of the two lens assemblies, which is designed
to compensate for changing spherical aberration, along the
optical axis; or to move each of the two lens assemblies of the
focusing/collecting arrangement along the optical axis.

43. (Cancelled)

44. (Currently Amended) The system of ~~any one of Claims~~
~~Claim 32 to 43~~, wherein said beam shaping assembly has one of
the following configurations: (i) comprises a lens assembly
designed to provide a small degree of divergence/convergence of
each of the first and second exciting light beams when arriving
at the focusing/collecting arrangement to provide semi-infinite
conjugation of each of said beams; (ii) comprises a lens
assembly designed to provide collimation of one of the first and
second light beams and a small degree of divergence/convergence
of the other of said first and second exciting beams when
arriving at the focusing/collecting arrangement to thereby
provide a semi-infinite conjugation of said other beam; (iii)
comprises collimating lenses in the optical paths of the first
and second light beams, respectively, propagating towards the

focusing/collecting arrangement; and (iv) comprises a lens assembly designed to provide a large degree of divergence/convergence of each of the first and second exciting light beams when arriving at the focusing/collecting arrangement to thereby provide finite conjugation of each of the first and second light beams.

45-47. (Cancelled)

48. (Currently Amended) The system of ~~any one of Claims Claim 31 to 47~~, comprising a lens assembly in the optical path of the first and second exciting beams generated by the light sources to affect the beams to provide substantially circular cross-section thereof.